TMF

July 1990

THE MAC FLYER - For Greater Safety in MAC Air Operations

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TMF

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WINNERS

1990 MAC FLIGHT SAFETY WRITING CONTEST

First Place

"The Final Authority"
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183 MAS (ANG)
Jackson, Mississippi

Second Place

"Sorry, I Can't Talk About It"
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53 MAS
Norton AFB, California

Third Place

"Reflections of Nature"
By Maj. Daniel G. Halpern
7 AREFS
Carswell AFB, Texas

HONORABLE MENTION WINNERS

"A Trip In Time"
By SMSgt. Tim E. Bridgeman
179 TAG (ANG)
Mansfield, Ohio

"M'Boy, We Didn't Need Aircrew Coordination Training In My Day. . ."
By Maj. Richard A. Pilling
OL "V" MACOS
Norman, Oklahoma

"Know Thy Enemy, For They Are Us"
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McGuire AFB, New Jersey

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By Capt. Charles T. Buntin
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McGuire AFB, New Jersey

"Confessions Of A Starlifter Pilot"
By Capt. Philip A. Bossert, Jr.
438 MAW
McGuire AFB, New Jersey

"Souls United"
By MSgt. Clyde H. Beal
130 CAMSQ (ANG)
Charleston, West Virginia

"Coffee Goes Only So Far"
By Capt. Philip A. Bossert, Jr.
438 MAW
McGuire AFB, New Jersey

"The Storm"
By TSgt. James W. McClain, Jr.
1275 TES
Edwards AFB, California

"Flying Into The Proverbial Ink Bottle"
By Lt. Col. J. Norman Komich
9001 Air Res Sq (AFRES)
Denver, Colorado

834th AIRLIFT

The "Hawaiian Eye."

Ms. Nancy W. H. Tang, the "real" boss of the 834th safety shop.

By Maj. Dale Van De Ven
Associate Editor

"Our biggest challenge is communications; it's a major concern because our area of responsibility is so large." It was with this introduction that Col. S. W. "Yogie" Bear, 834th Airlift Division (ALD)/DO, initiated the subject of dimensions and the ALD. The Division's area of responsibility covers 49 percent of the earth's surface. It currently begins at 140 degrees west latitude, stretches to the east coast of Africa, and extends south to Ant-

Capt. Dane A. Marolt, (left), 834 ALD/SEF, on the Yokota flight line with Maj. Don Rosenberry, (374 TAW/SE, at the time).

A1C. Steve Nelson, 834 ALD/LRC duty controller, managing a maintenance problem.

DIVISION

arctica. It covers 100 million square miles encompassing 22 free-world countries as well as areas within the Peoples Republic of China and the Soviet Union. In addition, the 834th is scheduled to assume the higher headquarters function in support of airlift in Alaska, further expanding its total geographical area of responsibility.

In 1978, the 834 ALD was activated at Hickam AFB, Hawaii, in an effort to better manage MAC airlift resources in the Pacific. The ALD's primary mission is management of the military airlift system within the Pacific. This is done under the authority of the Commander, Twenty-Second Air Force; the United States Commander-in-Chief Pacific (USCINCPAC); and the Commander-in-Chief Pacific Air Forces (CINCPACAF). Additionally, the Division manages airlift operations to include aeromedical evacuation, and airland or airdrop of combat forces, equipment, and materials. To accomplish this mission, the Division supplies airlift for all of DOD in the Pacific Theater.

To plan, execute, control, maintain, supply, and manage airlift, the ALD requires manpower far exceeding the 155 folks assigned to the headquarters at Hickam. The 834th includes over 4,200 airlifters in units spread throughout the Pacific. The ALD's major unit is the 374th Tactical Airlift Wing at Yokota AB, Japan. It supports the Pacific with five flying squadrons, employing four different types of aircraft; C-130s, C-21s, C-12s, and C-9s.

C-130 airlift is provided by the 21st and 345th Tactical Airlift Squadrons. Each squadron has ten C-130s capable of airland or airdrop of personnel and equipment. Special crew qualifications provide additional capabilities for low altitude parachute extraction and special operations low level. The 374th also has two operational support airlift squadrons which support PACAF's 5th, 7th, and 13th Air Forces. In addition, the 20th Aeromedical Airlift Squadron provides theater aeromedical airlift with three C-9s.

Additional larger units assigned to the ALD include: 603d Military Airlift Support Group (MASG), Kadena AB, Japan; 611 MASG, Osan AB, Korea; 624 MASG, Clark AB, Republic of the Philippines; 605th Military Airlift Support Squadron (MASS), Andersen AFB, Guam; and 619 MASS, Hickam AFB, Hawaii. The Division has units as far south as Australia and New Zealand and as far west as Diego Garcia in the Indian Ocean.

The Pacific Airlift Control Center (PALCC) is the focal point for command and control of aircraft operating in the Pacific. It's the link between 22d Air Force, unit command posts, airlift control elements (ALCEs), and aircrews. The PALCC exercises positive control of strategic and theater airlift around the clock through transportation, logistics, and operations controllers.

According to Maj. Michael McKenzie, 834th ALD/DOC, "A typical sampling of the volume we manage showed that over a six-month period we monitored a total of 35,000 sorties. This resulted in movement of over a million duty and space 'A' passengers, and over 82,000 tons of cargo."

PALCC controllers handle not only typical channel and exercise missions, but also get involved in air evacuations and search and rescue for missing aircraft or ships. They also manage INF treaty flights out of Yokota to the Soviet Union. Perhaps the most complex challenge facing PALCC controllers is weather evacuation. Major McKenzie pointed out that, "In the typhoon season, it's not unusual to see three storms in the Pacific at the same time. If it looks like a typhoon is going to hit a base, we not only have to consider the MAC resources in danger but often get requests from PACAF units to help deploy their people. During weather evacuations, our controllers draw up the plan, decide what they are going to evacuate, where they're going, and divert en route aircraft. We try to do this with as little mission impact as possible because, after it's all done, we have to pick up the pieces. Cargo and passengers still have to be moved, and users still need to be satisfied."

Foreign politics also have a direct effect on the level of activity going on in the PALCC. During a recent coup attempt in the Philippines, the decision was made to evacuate every MAC plane from Clark as soon as possible. According to Major McKenzie, "Within four hours of that decision, we had every plane off the ramp. That's not easy to do when you consider our geographical limitations. It means we have to distribute aircraft to Okinawa, Korea, Japan, and Guam, which pretty much fills up the ramp space."

Other routine, but very important, missions the PALCC watches closely are the support flights for the Pacific Fleet in the

834th's current area of responsibility.

"Fred" on the ice... at McMurdo.

(Left to right) Majors Michael McKenzie, 834 ALD/DOC, Rod Runyon, 834 ALD/DOCP, and Capt. Danny Leonard, "TAC" duty controller.

Indian Ocean area. Flights are run weekly, by way of Diego Garcia, into Oman. Without these missions, the Navy wouldn't get their supplies.

Considering the potential complexity of the operation, I was surprised to learn that, generally, the manpower on-hand for the operations division consists of only two officer and two enlisted controllers. This group of four is then divided into two divisions, "strategic" and "tactical." The strategic controller team handles strictly C-141 missions while the tactical controllers handle all other aircraft, including contract flights.

Once again, Major Mackenzie was able to provide some insight into controller duties.

"The operations side must balance cargo and duty passenger requirements with other considerations, such as aircraft "due home" dates. In addition, we are concerned with getting crews home by their 'scheduled return time.' We also have to consider factors such as: how long has this crew been operating, are they coming up on crew duty day, and what kind of activities have they been doing? Some of our missions have the crew up and down quite a bit and are labor intensive. They may have enough crew duty day to fly one more leg, but we consider all aspects of a mission, including fatigue, when making decisions."

While taking care of the crew is the responsibility of the operations division, another department, the Logistics Readiness Center (LRC), is responsible for the welfare of the airframe. The LRC team, comprised of maintenance and supply people, man the center around the clock and serve as the central point of contact for logistic problems throughout the Pacific. They coordinate movement of spare parts and maintenance repair teams in sup-

port of airlift, weather, rescue, and special operations aircraft, as well as Air Force Reserve and Air National Guard missions in the Pacific Theater. The LRC also supports aircraft of other Air Force commands operating MAC missions and, upon request, allied nation airframes.

During the past year, the 834 LRC has supported over 4,000 aircraft recoveries, and dispatched over 100 maintenance teams. On an average day, they support 12 to 15 aircraft and coordinate delivery of over 20 parts to support MAC missions.

As you may expect, day-to-day operations alone would be quite sufficient to keep everyone in the 834th pretty busy, but even more was expected from them this past year. According to Col. W. B. Caldwell, 834/LG, 1989 will be known as "The year of change."

Last year, HQ USAF directed a drawdown of the two C-130 squadrons from 16 to 10 aircraft per squadron and the 374th Tactical Airlift Wing, with associated units, to move from the Philippines to Yokota AB, Japan. This move, combined with the reduction in aircraft, generated a series of problems, including movement of aircraft, keeping aircrews current, coordinating transfer of aircraft with the guard/reserve, incorporation of H model C-130s, and parts supply support. All these areas were addressed, and as far as Colonel Caldwell is concerned, this was just another example of the outstanding work accomplished by 834th people.

The crews are trained and the airframes are maintained by DO and LG, but without the Transportation Directorate, the planes would be flying empty. Air transporters work long hours around the clock to keep the back of the airplane full.

Col. Don Brewer, 834 ALD/TR, noted that transporters work whatever hours are needed to process cargo, passengers, and load the planes. According to Colonel Brewer, "We've never allowed a plane to launch without a full cargo compartment because the clock said it was quitting time." Even though work shifts can extend well beyond eight hours, there's a high degree of satisfaction that goes with the job. Transportation troops seem to get a special feeling of accomplishment when they put Space-A passengers on flights. They witness, first-hand, the hardships endured by many, and Colonel Brewer recalled several instances when transporters opened their own homes to stranded Space-A travelers for a "hot and a cot," meaning a hot meal and a place to sleep.

Special Assignment Airlift Missions can provide unique challenges. Last year, 834th transporters climbed aboard a C-5 bound for China to prepare and load a Chinese Air Force Fighter that was airlifted back to the States for modification under the Foreign Military Sales program. Without deployable transporters, it's hard to imagine how the technical requirements of preparing such sensitive cargo could have been accomplished.

Perhaps the most unique operation the 834th is involved with is the yearly "Operation Deep Freeze," the annual resupply of the National Science Foundation at McMurdo station, Antarctica. This operation involves moving 1.3 million pounds of supplies and over 1,400 people.

Capt. Dane A. Marolt, 834 ALD/SEF, provided some first-hand information on this particular mission. "They cut the runway out of the ice every year, and every day they go out and check it. Three-foot cracks open up, so they fill them with water, let'm freeze, and plow'm back over. Visibility is awesome; on a clear day the only thing that limits you is the curvature of the earth. You can pick out McMurdo sixty miles out. The big problem is the uncertainty of the weather. At a moment's notice, you can get a complete whiteout. Crews plan a point of no return where they must have the gas to return to New Zealand and have communications with McMurdo to confirm acceptable weather. No confirmation—no mission. This year there was an airdrop right on the South Pole. The mission flew from Christchurch to McMurdo, put on some gas, took off, and dropped some timber right on the Geographic South Pole."

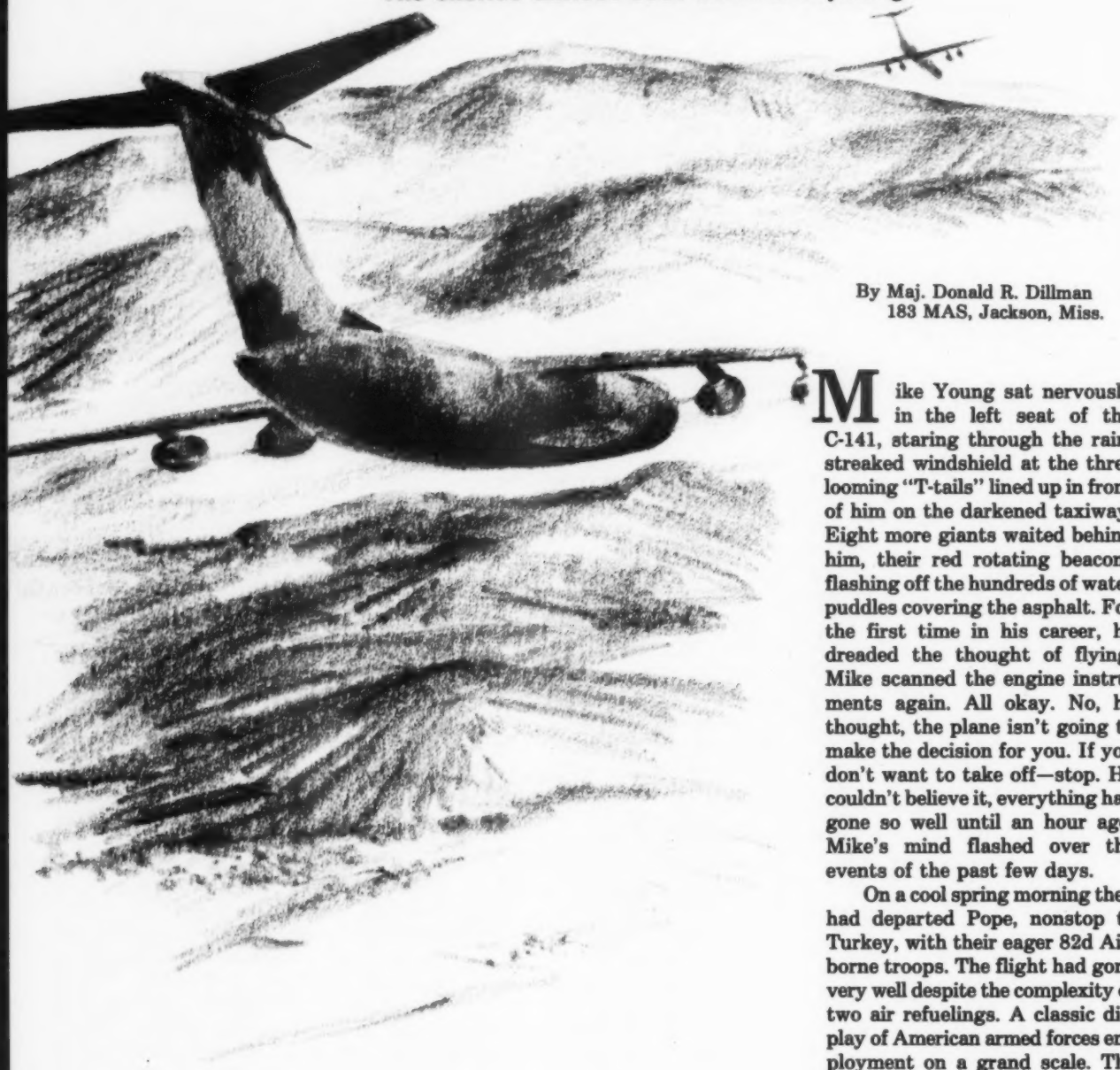
How does the Airlift Division ensure safety of the operational forces they control in theater? Guidance in this area is supplied by Col. Bear to each of his newly assigned controllers. "There are three priorities. The first is the preservation of resources, and the most important resources are qualified, trained people available to do the job. The second priority goes hand-in-hand with the first—that's safety. Your safety program is a tangible way to express concern for preservation of resources. If you have the first two priorities under control, then the third will naturally occur, and that's the mission. These priorities will work for any supervisor, at any level.

When asked what's on the horizon for the 834th, the Colonel responded; "The future challenges facing the Airlift Division all have to do with limited resources. We're looking at budget reductions, manning reductions, and if there's ever been a time when we had to be smarter about how we do business it's in the next five years."

Even though *TMF* was only able to spend a few days at the 834th, it was very apparent that the Division is proud of its mission in the Pacific and its members continually live up to the unit motto—*"ALL THE WAY."*

The Final Authority

" His silence almost cost them everything."



By Maj. Donald R. Dillman
183 MAS, Jackson, Miss.

Mike Young sat nervously in the left seat of the C-141, staring through the rain-streaked windshield at the three looming "T-tails" lined up in front of him on the darkened taxiway. Eight more giants waited behind him, their red rotating beacons flashing off the hundreds of water puddles covering the asphalt. For the first time in his career, he dreaded the thought of flying. Mike scanned the engine instruments again. All okay. No, he thought, the plane isn't going to make the decision for you. If you don't want to take off—stop. He couldn't believe it, everything had gone so well until an hour ago. Mike's mind flashed over the events of the past few days.

On a cool spring morning they had departed Pope, nonstop to Turkey, with their eager 82d Airborne troops. The flight had gone very well despite the complexity of two air refuelings. A classic display of American armed forces employment on a grand scale. The Army loved it. A complete suc-

1990 MAC FLIGHT SAFETY WRITING CONTEST—FIRST PLACE

cess—right until drop time.

"No drop." The winds were out of limits. The tension in the air was shattered by the news. What a letdown! Travel thousands of miles, have the troops in the door ready to jump into the black Turk ish sky, only to be pulled from the brink by something completely out of anyone's control.

Standing on the ramp back at Incirlik, Mike looked toward the just-rising sun with a blurred mix of fatigue, frustration, and satisfaction. An incomplete mission; but they had brought 12 planes from the east coast—safely and on time. Rubbing his hand over a day's growth of stubble reminded Mike he needed three things to be a happy man: a hot shower, a hot meal, and a cool mattress.

Walking toward the crew van pulling up in front of the airplane, Mike couldn't help but smile. He loved his job. He had enjoyed his first three years as a T-37 instructor, but now he was in the "real Air Force." In his short time as an aircraft commander he knew everyone was after the same thing—*safe and sane flying.* No need to push regulations. Mike had no way of knowing that his perception would be shattered in just a few hours.

Col. Joe "Duke" Striker paced nervously in front of the gathered aircrews, thinking about the night's activities. The ever-present unlit cigar was moving in time to some unheard march, his boots shining in the glare of the unusually bright base theater house lights. His flight suit and leather jacket were tailor-made to fit his football-hero physique. Tall and handsome, Duke looked as if he'd just stepped off the Hollywood set of some WWII "Airwar over Europe" film. He had the reputation of being hard charging and result oriented. There were never any excuses with the colonel, just right answers. He was not only the mission commander—but tonight, he would personally lead the formation. The colonel looked at his watch—exactly 2200 hours. Sitting down in the front row, he nodded to the fatigue-clad master sergeant waiting behind the podium.

"Good evening, gentlemen." The room became quiet as the weather briefing began.

"A cold front will influence the weather over your entire route and drop zone, resulting in extensive low level cloudiness and fog."

Mike's internal alarm started to softly ring as the weather briefer's words sank in. The monsoon rain falling on their 20-man "crew tents" for the last 24 hours had made sleep impossible. He looked over at his copilot and navigator; both were nodding off. Looking around the room, the situation was the same with most other crews. Until just an hour ago, they had all planned for simple single-ship departures, picking up opportune cargo as they returned to the U.S. Evidently, the colonel had gotten with the Army and plans had changed.

"In conclusion, gentlemen, the chances of getting this drop-off are somewhere between slim and none. Questions?" The experienced master sergeant did not meet Colonel Striker's cold glare.

A flight-suit-clad captain stood up and faced the crowd.

"This is normally where we would brief route study, drop zone analysis, and emergency procedures, but since we flew most of the route last night, the staff has decided further briefing is unnecessary." He looked quickly toward the colonel and then back to the surprised audience. "Be ready to start engines in 45 minutes. Dismissed."

A confused buzz of voices exploded in the room. They wouldn't pick up the route they flew from the U.S. last night until almost 100 miles from the base. Several aircraft commanders and navigators descended on the unfortunate captain to object. One particularly vocal captain had already started when Mike got within hearing distance.

"Between the tents, the rain, and everything else, my guys didn't get any sleep throughout the day. It's now almost midnight and you want us to launch into the weather for a 12-ship airdrop without so much as a briefing on the departure or route?"

"Captain, that's your problem if your men didn't properly use their crew rest," barked Colonel Striker.

The dissident group turned to face the colonel. "The Army came here to airdrop and I told them we wouldn't let them down," said the colonel, using his cigar to point at the group for emphasis. "We came to dance, gentlemen, and the band is playing."

A stonewall of determination met the young questioning faces.

"But, colonel, not only is this dangerous, but the weather briefer just said there is no real chance of even getting the drops off. How do we explain the risk for so little chance of gain?"

"That's what you get paid for, Captain, and if you can't hack it, we will find someone who can."

That rocked the entire group. The besieged aircraft commander looked around for help and support. Mike avoided his eyes and did something he would regret forever—nothing. He let his fellow aircraft commander swing in the wind under the irate colonel's blistering wrath.

Mike was snapped back to the present by the roar of jet blast. The first three airplanes, "Lifter," 1, 2, and 3 were safely airborne. Mike steered his huge plane down the runway, knowing the other two airplanes in his element would soon follow. Although he couldn't get the events of the last two days

completely out of his mind, he fell into the familiar routine—find the aircraft in front of him and provide a stable platform for the following two airplanes to join on. With 30 seconds between each takeoff, it would take almost six minutes to get everyone airborne. By that time the first plane would be almost 20 miles ahead.

Almost immediately, the first problem appeared. The station-keeping equipment, which allows each airplane to see the others on a small scope, wasn't working on all the planes. The leader decided to level off at 5,000 feet, fly straight ahead, and straighten things out. He had each aircraft with problems climb 500 feet above the level formation, slow down, and "drift back" over the top of the flight. That wasn't standard. Normally, problem aircraft would simply break out to each side of the formation. Since no study of the terrain on departure had been done, that could prove disastrous. One of the aircraft with problems was just in front of Mike.

As the seconds ticked by, Mike strained to see out the windscreen. There was no moon, there were no stars, and there were no lights on the ground. He could just make out the twinkling red beacon on the aircraft backing toward him. They started running into low-level clouds corresponding to the higher terrain. He lost sight of the aircraft passing overhead.

The formation was "capped" by aircraft; unable to climb and still flying toward higher ground.

"This heading takes us through some pretty high terrain," Frank, the navigator, sounded the first warning. "The highest peak is just over 6,000 feet and is about 10 miles away. That gives us about three minutes." He didn't sound nervous or concerned.

Mike confronted the colonel over radio, "Lead, this is second element lead; we're showing some high terrain at 12 o'clock. We need to climb immediately."

"We see it on the chart and don't think it will be a factor. It should pass a few miles off to one side. We'll be climbing in a few minutes when we get the flight formed."

Mike didn't like the answer. The ride started getting rougher, another sign of rising terrain. Frank couldn't stand it anymore. "We've got airplanes spread out all over the place. He may not hit anything, but what about us? I show less than five miles to the hills; we need to turn or climb." Mike noticed the edge on Frank's voice but couldn't allow himself to react to it. He needed to know where the plane drifting back over his element was and get his guys out of there.

"Damn it Mike, we need to climb NOW." Frank was getting nervous.

Then it started. Mike saw it first, the radar altimeter started to wind down rapidly.

"WHOOP WHOOP PULLUP . . . WHOOP WHOOP PULLUP!"

The ground proximity warning exploded in the darkened cockpit.

"Second element, emergency climb NOW." Mike screamed over the radio, simultaneously shoving the throttles full forward. He couldn't believe this was happening. A wild mix of emotions raced over him; frustration for running out of options, fear for both himself and his crew, and most of all anger for letting himself get into the situation in the first place.

"800 . . . 700. . ." the radar altimeter wound down without hesitation. Mike fixated on the instrument panel. He could see every detail of every instrument. The throttles were pushed hard forward and he wanted more.

"600 . . . 500." The copilot called out the altitudes with an eerie calm.

"400 . . . 300." Mike couldn't believe it. This only happens to someone else.

"300. . . 300 . . . 500 . . . 800 . . .we're climbing!"

The deadly, yet unseen cloud-covered ridgeline, fell away rapidly from the soft '141 underbelly. Mike suddenly realized he had been holding his breath. Letting it out with a groan, he relaxed his grip on the yoke.

"Copilot's airplane," Mike didn't wait for the complimentary answer from his startled copilot before sliding his seat away from the control wheel. His hands shook uncontrollably. The previously ignored fear washed over him. His closed eyes kept out the world but vivid replays flooded his mind. Fear gave way quickly to white-hot rage—rage at the colonel for putting them through the past few minutes; rage at his silence which had almost cost them everything.

Mike looked around the darkened cockpit; the young copilot concentrating so hard on flying, the rugged flight engineer fiddling with an inop engine gauge, and the perspiring navigator slowly programming the nav computer. Mike had let them all down. He felt very old and tired.

Maj. Donald R. Dillman, a faithful contest participant, is a C-141 flight examiner in Jackson, Miss., and a civilian pilot with American Airlines.

We Have A Fire!

Good crew coordination at work.

By S/O Bill Bauerle
Salt Lake City, Utah

Having survived a recent aircraft fire, I feel there are several lessons learned worth sharing. First I'll relate the story, then I'll share the lessons learned.

Flight 1558 was a through flight from Los Angeles to Edmonton, Canada, with an intermediate stop in Salt Lake City. I arrived at the aircraft first and was met by the Flight Attendant in charge. She introduced herself and one other attendant who was seated in seat 2B across from the forward galley. I immediately began my normal routine, as I wanted to get a head start on the paperwork rush. The Captain arrived within the next few minutes and the First Officer shortly after. I was seated at the Second Officer panel with the Captain and First Officer standing behind me. One attendant had gone aft and was handing out Canadian customs forms to the "through passengers" and two pre-boards. We had no passengers seated in first class yet. The remaining forward attendant was still seated in 2B when we all heard a loud, muffled "bang," accompanied by a shuddering of the aircraft, which felt like a catering truck had backed into it.

As the entire flight crew simultaneously asked "What's that?" the seated flight attendant yelled, "We have a fire . . . get everyone out!"

From my position I could see sparks, flames, and smoke coming into the aisle from the galley area. As

the Captain and First Officer exited the cockpit to investigate, I turned, got out of my seat, and reached for the fire extinguisher. I thought we had experienced an oven explosion. I yelled down the aisle to the attendants in the rear to use the aft airstair, as it was down. My instructions were unnecessary as they were already in the process of moving in that direction. I had my hand on the fire extinguisher as I again glanced down the aisle, which was rapidly filling with smoke and flames from behind the galley. Realizing the hand extinguisher was useless against the degree of fire and smoke now filling the forward portion of the cabin, I decided it was time to exit.

As I exited the cockpit and headed toward the forward entry door, I bent down and looked beneath the smoke obscuring the upper half of the cabin and noticed an elderly couple still on board. I changed direction and decided I would exit through the aft exit with this couple. I ran through the first class compartment (even though I have no memory of the fire or smoke) and reached the elderly couple.

The elapsed time from the beginning of the fire until reaching this point was perhaps 7-8 seconds. I didn't know which direction either the Captain or First Officer had exited. They, in fact, had run back to the galley and immediately returned to the gate area to alert the fire department. Attempting to return to the aircraft, both were blocked by the impassable smoke in the jetway.

Reaching the elderly couple, I directed them to exit to the rear. They were ahead of me as the aircraft continued to fill with smoke.

I could still see to the rear of the aircraft when I felt something passing by me from behind. I was instantly enveloped by very dense, black, putrid, soot-filled smoke. It was as if someone had pulled a bag over my head. I was unable to breathe and it felt as if someone had physically shut off air to my lungs. I dropped immediately to my knees and began to crawl as rapidly as possible to the rear. After a very brief moment, I realized I would not be able to reach the rear of the aircraft at this rate and I turned left into the next row of seats, locating the overwing exit.

Needless to say, I was quite relieved. I stood and grasped the wing exit handle and, as I pulled, I remembered my initial training and how I must pull down and then remove the exit inward. However, as my adrenalin level was quite high at the time, I simply pulled and the entire window exit was behind me. I then dove head first through the exit onto the right wing of the aircraft.

After jumping to the ground from the rear of the wing, I made my way to the rear of the aircraft to find the elderly couple already on the ground and a flight attendant helping them. Within a few seconds, the aft airstairs began belching the same black smoke I had encountered.

The elderly couple had stayed just ahead of the smoke as it progressed aft through the aircraft. The elapsed time from inception of the fire until I was on the ground outside the aircraft was probably no more than 45 seconds.

In retrospect, there are many factors contributing to the successful evacuation. Most important and critical were the immediate and positive actions of the flight attendants. Due to the speed with which the aircraft filled with smoke, the time saved by the forward flight attendant's immediate action in directing the evacuation undoubtedly saved lives. Had the flight crew stopped to diagnose the situation and react accordingly, precious seconds would have been lost. The flight attendants' professional and positive control of this emergency was paramount to the outcome.

I have always respected the vital role of flight attendants, but have, since this experience, gained an added respect for their actions and abilities.

Another critical factor comes to mind each time I think of this incident—*TIME*. The shortness of time required for this aircraft to become uninhabitable was frightening. Any action which would have added even a few seconds to the evacuation could have resulted in loss of life.

In closing, I learned several lessons—lessons that will always be with me from now on: There is no such thing as an insignificant fire. Any evidence of fire/smoke requires an immediate response. Emergency equipment such as protective breathing equipment (PBE), oxygen masks, or fire extinguishers, are invaluable. However, just as important as knowing how they work and their limitations, is knowing how to use them without stopping to read directions. I have donned the PBE in training, yet had the equipment been available on this aircraft, I'm not sure I could have taken it from its holder without wasting several precious seconds to determine how to get it out. Now, I not only know the location of each piece of emergency equipment (which I always knew),but can describe exactly how to extract it and can do so blindfolded. I also make sure nothing blocks, covers, or gets in the way of any emergency equipment. I hope I never go through this again, but if I do, I'll be better prepared mentally—beyond my required training.

We were extremely fortunate in this fire. Our actions could more appropriately be called "reactions." I am extremely thankful for the reactions of the crewmembers, with the minimum of communication. We were fortunate! How prepared are you?

Adapted From *Up Front*, 1st Quarter 1990

Four-Engine Power Fluctuation

The C-130 has been plagued with four-engine power fluctuations or "rollbacks" that occur when rpm and torque fluctuate in response to a failure in the aircraft electrical power or synchrophaser systems. These fluctuations are usually transient, lasting only a second or two, but the fact that the engines are responding to an "uncommanded" input can have an unsettling effect on the crew. This article discusses this type of engine power fluctuation, the cause and influence on the aircraft, and methods to reduce their effects or help prevent their occurrence.

SYNCHROPHASER OPERATION

Since the synchrophasing system is involved in all cases, a brief review of the system is helpful in understanding the nature of the problem. Control of propeller pitch, and consequently engine rpm, is maintained primarily by mechanical governors in the propellers. However, response of the mechanical system is augmented and made more precise through stabilizing action of the synchrophaser.

The synchrophaser acts through propeller flyweight governors to automatically control propeller rpm and "phase," rotational position relationship among the blades of the four propellers. When a "master" engine (Number 2 or Number 3) is selected, the synchrophaser senses the position of that engine's blades and adjusts the relative position of the three "slave" propellers to achieve optimum phase relationship for all four.

Maintaining the same rpm and an optimized phase relationship within close limits reduces propeller noise and vibration and decreases airframe stress (Fig. 1). The synchrophaser also anticipates changes in propeller speed due to throttle changes and the effects of external forces, and furnishes signals to help suppress any tendency of the mechanical

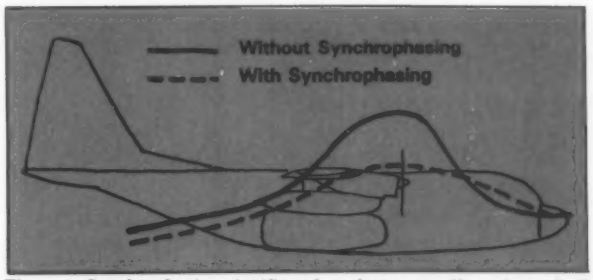


Figure 1. Synchrophasing significantly reduces propeller noise and vibration levels.

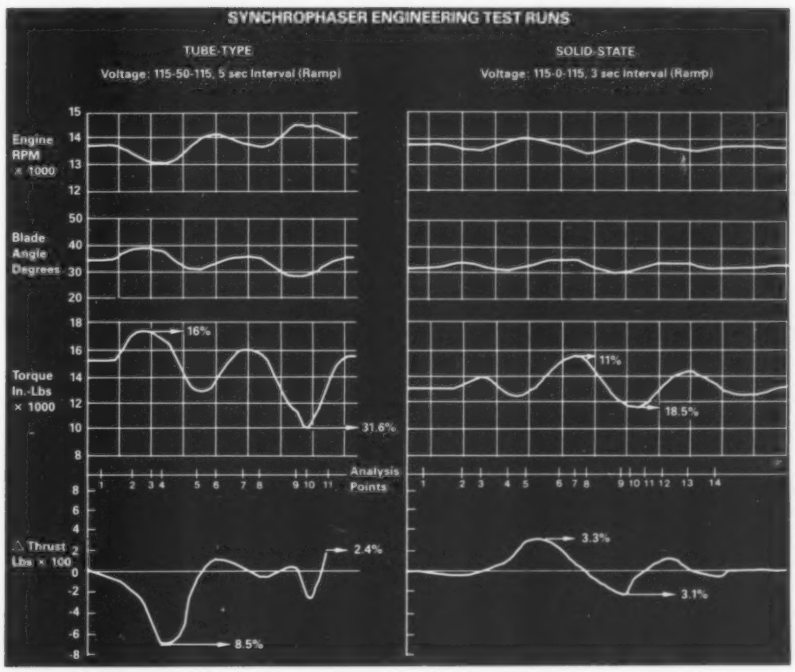


Figure 2.

governor to overshoot or undershoot proper governing speed.

Older aircraft are equipped with a vacum tube synchrophasing unit while newer aircraft are equipped with a solid-state synchrophaser. The new unit has improved accuracy, stability, and ruggedness. There are some differences in their operation; however, they are interchangeable.

Whichever unit is installed, propeller synchrophasing remains a secondary function and the system's influence on rpm control is limited. The primary hydromechanical governing system continues to function in the event of an electrical malfunction, ensuring safe aircraft operation.

"MANUALLY" INDUCED ENGINE POWER FLUCTUATIONS

There are occasions when engine rpm and torque will fluctuate although no failure has occurred and the synchrophasing system is operating normally. Fluctuations in these cases will typically be less than + or - two percent rpm and less than 1,000 inch-pounds of torque. Some of the conditions that can induce such normal fluctuations are:

1. Selecting normal governing will sometimes cause a propeller to change rpm, particularly if a master engine has been selected previously.

2. Selecting a master engine will also affect all engines, but the changes will usually be gradual and would be expected to show up only in the form of an audible change in propellers.

3. In the case of the solid-state unit, opening the synchrophaser circuit breaker and then reengaging it with propellers in normal governing and the master engine selected may cause fluctuations.

Note: Each situation can cause more noticeable fluctuations if the speed bias motor in the propeller is not set to the middle of its range. The potentiometer is centered during propeller reindexing. In the case of the tube-type synchrophaser, periodic resynchrophasing of the system may be necessary to cancel any synchrophaser circuit offsets accumulating during operation.

The solid-state synchrophaser uses semiconductor devices which do not exhibit any circuit offsets during operation. Thus, no resynchrophasing or reindexing is required and none should be attempted following initial reindexing, except in the course of approved maintenance procedures on the ground.

If the resynchrophase switch on a solid-state unit is actuated when reindexing is not in progress, the speed bias motor feedback potentiometer could be driven off center. The synchrophaser would not have its full range of adjustment. This could cause the engine to operate operate at a different speed in normal governing than in mechanical governing and would be noticeable as a 0.3 percent or more rpm change when switching from mechanical to normal governing and vice versa.

ELECTRICALLY INDUCED ENGINE POWER FLUCTUATIONS

To be effective, the synchrophaser must be able to make adjustments to all propellers simultaneously, and all must respond similarly to any inputs to the synchrophasing system. This means the synchrophaser allows a single failure to affect the operation of all four engines.

From September 1986 through June 1989, the U.S. Air Force documented a total of 52 power rollback incidents. Thirty-seven of these happened when the aircraft experienced an interruption in essential AC bus power. Twelve were caused by failure of tube-type synchrophasers, one by a solid-state synchrophaser failure, one was traced to a wiring problem, and one was the result of a Number 2 engine gearbox failure.

Further analysis shows that over 70 percent of the reported fluctuation incidents occurred as a direct result of electrical system failures in flight. Since essential AC bus power input is common to all four syncrophaser channels, an essential AC bus power interruption can readily affect operation of all four engines. The exact amplitude of power change is not predictable since it depends on the specific failure mode and the type of synchrophaser involved.

TEST AND RESULTS

Electrical system failures were understood, but further research was required to permit practical countermeasures to be developed. The problem is typically transitory in nature, and because of difficulties in conducting trouble-shooting activities in an operating aircraft, it was necessary to develop ground tests to determine which engine controls were being affected during electric power failures.

The most important of these tests were conducted on a specially instrumented engine and test stand at the Allison Gas Turbine

Division of General Motors. The tests were set up so voltage could be varied individually to the synchrophaser, the temperature datum (TD) amplifier, and engine instruments. Critical responses of the engine were monitored, (torque, rpm, fuel flow, TIT, and propeller blade angle).

The test results demonstrated the following points:

1. Voltage variations can command propeller pitch changes during an electric power system malfunction.

2. Torquemeters are sensitive to voltage variations and, therefore, are unreliable indicators of actual torque during electrical power interruptions.

3. The TD amplifier system does not contribute to four-engine power fluctuations.

The tests further showed that synchrophaser type had an important impact on the amplitude of engine power fluctuations. The engine experienced the most pronounced fluctuations using a tube-type synchrophaser, with rpm changes of up to six percent, and torque variations as high as 4,500 inch-pounds.

With the solid-state synchrophaser, engine fluctuations were much less significant. In this case, rpm changes in the test engine were less than two percent and torque variations less than 1,500 inch-pounds. These differences can be attributed to the improved power supply regulation in the solid-state unit, plus the incorporation of an internal speed reset circuit that inhibits any speed or throttle derivative (anticipation) correction for 1.9 seconds upon restoration of electrical power.

The sensitivity that torquemeters showed to voltage variations on the essential AC bus during tests was of particular interest. When the voltage was varied only to the torquemeters, they would indicate torque fluctuations of + or - 5,000 inch-pounds, even though the engine torque remained constant. This led to the conclusion that when a four-engine fluctuation occurs as a result of an electrical malfunction affecting the essential AC bus, the torque readings are an unreliable source of data. It would be possible in some circumstances to get torquemeter readings indicating a power fluctuation when none had occurred.

THRUST EFFECTS

Calculations based on tests showed thrust losses with the tube-type synchrophaser were nominally only nine percent when the torque loss was 27 percent. The disparity between these values arises from the fact that although torque decreases, as the propeller blade angle is decreased rpm increases at the same time. Therefore, resulting changes in thrust and effect on the airplane flight parameters are minimized. Figure 2 shows results of some additional test runs which illustrate the relatively small magnitude of thrust losses experienced during voltage fluctuations.

The effect on a 120,000-pound aircraft during takeoff would be only a 0.04G decrease in the rate of acceleration, with continued airspeed and negligible effect on altitude. The effect on a higher gross-weight aircraft is even less, with only a 0.03G decrease in acceleration for aircraft weights up to 175,000 pounds.

A review of test data was also performed in order to calculate the effects on total engine thrust resulting from a failure in the synchrophaser system itself, rather than in the electrical system. In worst-case failure modes, thrust could theoretically be reduced by up to 27 percent, roughly equivalent to losing one engine. In such an extreme case, this condition would be corrected upon selection of mechanical governing.

STABILIZING INPUT VOLTAGE

A thorough review of test results and data from aircraft incidents shows there are several failure modes that can cause engine power to fluctuate. They all affect the synchrophaser system, which in turn causes changes in engine rpm.

New production aircraft have included solid-state synchrophasers as standard equipment. Effects of electrical power system interruptions on this unit are transitory and of small amplitude, with engine rpm typically changes + or - two percent. The overall effect on the aircraft when a tube-type synchrophaser is installed can be more significant in terms of thrust loss and changes in engine sound and vibration levels but are still too small to pose a flight safety problem. Recommended flight and maintenance procedures are considered adequate to keep the incidence of in-flight electrical system power interruptions to a very low level.

The Air Force has chosen to limit the effects of electrical power interruptions on its tube-type synchrophaser-equipped C-130s by implementing the following:

1. Improvement of maintenance for the electrical system, thus reducing electrical failures.

2. Installation of a solid-state synchrophaser on all C-130 aircraft.

3. Installation of a constant voltage transformer in the AC power line of the synchrophaser preventing brief interruptions in the flow of AC power. ✈

Adapted From *Lockheed Service News.*

As of 30 September

MAC UNIT MISHAP FREE FLYING YEAR MILESTONE AWARD

40 YEARS OR MORE

1 MAS
64 TAS

30 YEARS THROUGH 39 YEARS

1 HS
6 MAS
14 MAS
73 AAS (Assoc)
76 MAS
96 TAS (AFRES)
115 TAS (ANG)
137 TAW (ANG)
156 TAS (ANG)
167 TAS (ANG)
180 TAS (ANG)
183 MAS (ANG)
185 TAS (ANG)
193 SOS (ANG)
305 ARRS (AFRES)
312 MAS (Assoc)
313 MAS (Assoc)
327 TAS (AFRES)

25 THROUGH 29 YEARS

9 SOS
55 WRS
58 MAS
63 TAS (AFRES)
97 MAS (Assoc)
130 TAS (ANG)
136 TAW (ANG)
142 TAS (ANG)
187 TAS (ANG)
301 ARRS (AFRES)
302 TAW (AFRES)
303 TAS (AFRES)
328 TAS (AFRES)
403 TAW (AFRES)
459 MAW (AFRES)
756 MAS (AFRES)
758 TAS (AFRES)
1467 FCS

20 THROUGH 24 YEARS

4 MAS
7 SOS
36 TAS
53 MAS
53 WRS
55 AAS
68 MAS (AFRES)
86 MAS
94 TAW (AFRES)
135 TAS (ANG)
143 TAS (ANG)
144 TAS (ANG)
146 TAW (ANG)
164 TAS (ANG)
181 TAS (ANG)
300 MAS (Assoc)
301 MAS (Assoc)
315 MAW (Assoc)
326 MAS (Assoc)
335 MAS (Assoc)
337 MAS (AFRES)
356 TAS (AFRES)
445 MAW (Assoc)
446 MAW (Assoc)
707 TAS (AFRES)
728 MAS (Assoc)
729 MAS (Assoc)
730 MAS (Assoc)
732 MAS (Assoc)

10 THROUGH 19 YEARS

7 MAS
8 SOS
9 MAS
11 AAS
17 MAS
17 SOS
17 TAS
18 MAS
20 AAS
20 MAS
21 SOS
21 TAS
30 MAS
31 SOS
Det 3, 37 ARS
Det 5, 37 ARS
Det 8, 37 ARS
Det 9, 37 ARS
Det 10, 37 ARS
Det 24, 37 ARS
41 TAS
50 TAS
56 ARS
56 MAS
61 TAS
67 SOS
89 MAW
Det 1, 89 MAW
102 ARRS (ANG)
109 TAS (ANG)
133 TAW (ANG)
137 MAS (ANG)
139 TAS (ANG)
155 TAS (ANG)
158 TAS (ANG)
304 ARRS (AFRES)
326 MAS (Assoc)
345 TAS
357 TAS (AFRES)
439 MAW (AFRES)
512 MAS (Assoc)
514 MAW (Assoc)
616 MAG
701 MAS (Assoc)
702 MAS (Assoc)
707 MAS (Assoc)
708 MAS (Assoc)
709 MAS (Assoc)
711 SOS (AFRES)
815 TAS (AFRES)
1400 MAS
Det 1, 1400 MAS
Det 2, 1400 MAS
1401 MAS
Det 1, 1401 MAS
Det 2, 1401 MAS
Det 3, 1401 MAS
Det 4, 1401 MAS
Det 3, 1402 MAS

MAC UNIT MISHAP FREE FLYING-HOUR MILESTONE AWARD

800,000 HOURS

76 MAS

650,000 HOURS

1 MAS
6 MAS
14 MAS

500,000 HOURS

4 MAS
62 MAW

450,000 HOURS

86 MAS
137 TAW (ANG)

400,000 HOURS

53 MAS
89 MAW

350,000 HOURS

136 TAW (ANG)

300,000 HOURS

11 AAS
1401 MAS

250,000 HOURS

9 MAS
302 TAW (AFRES)
437 MAW
438 MAW
445 MAW (Assoc)
446 MAW (Assoc)
459 MAW (AFRES)
1400 MAS

220,000 HOURS

36 TAS

200,000 HOURS

17 MAS
315 MAW (Assoc)
146 TAW (ANG)

160,000 HOURS

55 WRS

150,000 HOURS

7 MAS
8 MAS
18 MAS
20 MAS
21 TAS
41 TAS
50 TAS
61 TAS
345 TAS
439 MAW (AFRES)
514 MAW (Assoc)

140,000 HOURS

183 MAS (ANG)
97 MAS (Assoc)
327 TAS (AFRES)

130,000 HOURS

1 HS

120,000 HOURS

64 TAS (AFRES)
96 TAS (AFRES)
156 TAS (ANG)
167 TAS (ANG)
183 MAS (ANG)
185 TAS (ANG)
313 MAS (Assoc)

100,000 HOURS

9 SOS
13 MAS
30 MAS
34 TATG
41 MAS
53 WRS
73 AAS (Assoc)
115 TAS (ANG)
130 TAS (ANG)
139 TAS (ANG)
139 TAS (ANG)
180 TAS (ANG)
187 TAS (ANG)
193 SOS (ANG)
312 MAS (Assoc)
443 MAW
729 MAS (Assoc)
Det 1, 1401 MAS
1467 FCS

80,000 HOURS

142 TAS (ANG)
158 TAS (ANG)
164 TAS (ANG)
181 TAS (ANG)
300 MAS (Assoc)
328 TAS (AFRES)
335 MAS (Assoc)
337 MAS (AFRES)
356 TAS (AFRES)
512 MAW (Assoc)
701 MAS (Assoc)
730 MAS (Assoc)
732 MAS (Assoc)
756 MAS (AFRES)
758 TAS (AFRES)
Det 2, 1401 MAS

60,000 HOURS

17 TAS
55 AAS
68 MAS (AFRES)
135 TAS (ANG)
143 TAS (ANG)
144 TAS (ANG)
155 TAS (ANG)
303 TAS (AFRES)
305 ARRS (AFRES)
357 TAS (AFRES)
700 TAS (AFRES)
702 MAS (Assoc)
707 MAS (Assoc)
711 SOS (AFRES)
815 TAS (AFRES)
Det 2, 1400 MAS

50,000 HOURS

10 MAS
16 TATS
30 MAS
37 TAS
57 MAS
58 MAS
62 TAS
137 MAS (ANG)
435 TAW
773 TAS
1551 FTS

40,000 HOURS

7 SOS
8 SOS
22 MAS
Det 5, 37 ARS
55 AAS
56 MAS
67 SOS
301 MAS (Assoc)
304 ARRS (AFRES)
708 MAS (Assoc)
709 MAS (Assoc)
Det 1, 1400 MAS
Det 3, 1401 MAS
Det 4, 1401 MAS
Det 3, 1402 MAS

What Did He Say?

Communication is critical to safe aircraft operation. Clear and concise verbiage must exist, not only between aircrew members but between the aircrew and ATC. In support of this effort, *TMF* is proud to present our first pilot/controller terminology quiz, taken from the pages of the *Airman's Information Manual.*

1. When you "acknowledge" a message you're saying you:
   a. Have received the message.
   b. Have received and understand the message.
   c. Have your radio turned on.
   d. Agree to comply with the message.

2. "Additional Services" provided by ATC include:
   a. Items of interest to the local vice squad.
   b. Bird activity information.
   c. Weather and chaff information.
   d. Both b and c.

3. The "aerodrome" is intended to be used either wholly or in part for the arrival, departure, and movement of aircraft and includes:
   a. Defined areas of land.
   b. Buildings, installations, and equipment.
   c. Defined areas of water.
   d. All the above.

4. The correct way to transmit Airway "V12" and Jet route "J533" is:
   a. Victor one two, Juliet five three three.
   b. Victor twelve, Juliet five hundred thirty-three.
   c. Victor twelve, J five thirty-three.
   d. Victor one two, J five three three.

5. An "Airport Advisory Area:"
   a. Is within 10 miles of an airport.
   b. Does not have a control tower/or the tower is not in operation.
   c. Has a flight service station.
   d. All the above.

6. A message prefixed by the words "ATC advises, clears, or requests" was sent by an Air Traffic Controller.
   a. True.
   b. False.

7. When issuing a "Broadcast," the sending station expects a reply.
   a. True.
   b. False.

8. A "Ferry Flight" is conducted to:
   a. Deliver an aircraft from one location to another.
   b. Move an aircraft to and from a maintenance base.
   c. Meet new and interesting people.
   d. Both a and b.

9. The term "Flight Line" means:
   a. Where you park your aircraft.
   b. A horizontal depiction of your intended path of travel on a aeronautical chart.
   c. Movement of a civil photogrammetric aircraft along a predetermined course.
   d. The boundary markers outlining the edge of the aircraft parking area.

10. The phrase "Have Numbers" means:
   a. The pilot is participating in illegal gambling.
   b. The controller knows the aircraft's identification numbers.
   c. The pilot has received runway, wind, and altimeter information only.
   d. The controller is aware of the aircraft's altitude and airspeed.

11. When a pilot declares "Minimum Fuel" it means:
   a. He must land immediately.
   b. Upon reaching the destination, he can accept little or no delay, but is not in an emergency situation.
   c. An emergency situation is possible should any undue delay occur.
   d. Both b and c.

12. ATC advises you're about to enter a "VIP Level 5" area; this means:
    a. The pilot-in-command must have at least a commercial rating.
    b. The parking area is reserved for commercial aircraft only.
    c. Radar returns indicate thunderstorms with intense precipitation.
    d. There are a lot of high-ranking military officers in the area.

13. The response "Roger" means:
    a. You understand the message.
    b. You agree to comply with the message.
    c. You have received the entire last transmission.
    d. You understand and will comply with the message.

14. The term "Sail Back" means:
    a. The return leg of an overwater flight.
    b. A maneuver during high wind conditions where float plane movement is controlled by water rudders/opening and closing cabin doors.
    c. The pilot's radio response to an ATC inquiry.
    d. The return portion of a boomerang's flight path.

15. When a "Special Emergency" is declared, the crew is experiencing:
    a. A failure of the onboard lavatory.
    b. Weather-related difficulties.
    c. A severe mechanical failure.
    d. A condition of air piracy or other hostile act by a person(s) aboard the aircraft.

16. The term "Wilco" means:
    a. I have received your message.
    b. I understand your message.
    c. I will comply with your message.
    d. All the above.

The source for all questions, with the exception of Number 4, were taken from the Pilot/Controller glossary, Appendix One. Question Number 4 can be found in Section II, Para 200.

Answers

1. a. (b is correct under ICAO, but not FAA), 2. d., 3. d., 4. c., 5. d., 6. b., 7. b., 8. d., 9. c., 10. c., 11. d., 12. c., 13. a., 14. b., 15 d., 16. d.

Copilot Syndrome

Sitting on your hands

By Maj. Dan Todd
21AF/SEF

This story dates back to my early days as a new C-141A copilot. Everyone remembers those early days; your leather name tag still smelled like leather, and you couldn't get enough of "flying the line." Well, I was no exception. I probably had two or three trips under my belt and thought I was really starting to get a handle on the MAC system. I had done a few air reps, "Relay AC 2 Mike Alpha . . ." and even landed several times at European destina-

tions. When I showed for this particular mission, I was as eager as ever.

My aircraft commander was a captain with about a year in command. The mission was a support run for a bunch of fighters deploying to a German airfield near the North Sea. Our initial leg had been routine, and after a good night's sleep, we prepared to leave the Azores. The forecast ceilings were fairly low throughout the European continent, and temperatures in Northern Germany would be below zero. Our weather prognosis called for 300 and 1 with gusty surface winds. "No sweat," I thought. That's 100 feet and a half mile to the good. Besides, they had a PAR and a TACAN. The winds were right on the limits for runway condition reading (RCR) of 5, but I had never actually seen a runway iced over that bad. What were the chances the RCR would really be that low?

We received our first weather update about three hours out. We had snow showers in the vicinity and moderate icing was forecast from the surface to 5,000 feet. "Boy, it's a good thing it isn't severe," I thought. "We might have to go somewhere else." Besides, the anti-ice system would surely make short work of any ice build-up. After all, wasn't that why they put it on the airplane? The engineer was busily going through his charts, and the nav was working up fuel calculations for our new (and more distant) alternate. We'd have to climb to make these new numbers work. I sat there thinking how great it was to see the crew working together. I glanced over at the AC who seemed to be a little apprehensive. What could be the problem? Everything was within limits. We updated weather several more times (a wasted effort, I thought) and talked to command and control. They didn't see any problems, so we pressed on.

"We'll have enough gas for one crack at it; then we'll have to head for our alternate. That's assuming the cruise winds don't get any worse," our nav professed. The winds were stronger than forecast (on the nose) but were supposed to improve, as was the temperature deviation. I dismissed both these items immediately since we had written proof on our computer flight plan that conditions were going to get better. We began our descent and entered light, occasionally moderate, turbulence. I thought this was good. If there happened to be any ice on the wing root (an area the engineer emphatically pointed out as not deiced) it would be shaken free. The AC was still concerned. The aircraft heading was bouncing around now, but my radio calls (except for Bonjour Rhine-radar) were by and large pretty stellar.

The winds were right on the limits for the RCR, with blowing snow. We were picking up ice but the anti-ice was functioning and apparently doing its job. I was running the prelanding checklists. The airplane flexed and bounced in its continuing descent, and the heading varied + or - 3 to 5 degrees. I glanced over at the AC and saw a sight I'll never forget. He had one cigarette burning in the ash tray, one in his left hand (which was controlling the yoke) and he was lighting another! We were on final now, holding ten knots for the gusts (I remembered that from the briefing), or at least attempting to do so. The airspeed was varying + or - 5 knots almost at will. At one hundred above, we saw the lights. "Land," I said triumphantly, not realizing this would be much easier said than done.

We picked up some drift in those last couple hundred feet which the pilot corrected for nicely. Our flare was slightly ballooned. As we touched down, we weather vaned into the wind and began sliding sideways down the runway. Even though all the signs indicated this would be no ordinary landing, I hadn't picked up on it until that very moment. I deployed the spoilers and sat there wondering who would win, the wind or our AC. No one said a word. Through skill and experience, the pilot coaxed the nose back to runway heading, and we began tracking straight. It was only then that breathing and movement returned. As we taxied to parking, a smile returned to the AC's pallid face. "That was a landing you don't see every day," he said, his voice cracking a little. Thank goodness! I was still choking my heart back down my throat and was a little embarrassed too. Even for that stage in my career I had done very little to help our situation.

I had been a victim of what we now call copilot syndrome. I was new and had complete faith the pilot was going to get us down safely. I hadn't thought about a possible go around, or what I might say to approach control in the event we had to go somewhere else. I couldn't even remember where our alternate was!

We made it in that day, but there were a lot of factors working against us—any of which could have changed the end result. My safety experience has taught me you have to be ready with a new plan when the "doors" start closing. You have to realize that when you're running out of plans, you can't continue blindly onward, allowing that last door to close.

Certain mission legs are innately more stressful than others. We must be aware of things around us when things start to get tense. We must divide the duties and, if necessary, hold, get a box pattern, or put it down if the prospects don't look good. I don't know if my AC ever realized he had three cigarettes burning at once, but he knew we were in for some gyrations early on. Don't you be caught off guard!

C.R. TERROR

The Omnipotent One in the Atomic Age

"Greetings, Sammy," The World's Greatest Aviator bellowed as he dropped his hand-tooled, baby blue B-4 bag in the corner and strode into the flight planning room. "How is the paperwork coming? Are we ready to get this show on the road?"

"Just about, Chief," Long Sufferin' Sam replied, looking up from the table where he had been working. "I've got the flight plan done and picked up the classified nuclear mission kit this morning. The weather looks good."

"Outstanding, m'boy," C.R. chuckled, rubbing his hands together. "Let's wrap it up and get moving."

"Just a minute Chief," Sam said. "Considering the mission, don't you think we oughta get everyone together for a predeparture briefing?"

"Balderdash, Sammy," bellowed C.R. "How many times must I remind you not to sweat the small stuff? These guys don't need me to tell them how to do their job. In MAC we're all professionals, right? All these briefings and rebriefings are simply a waste of time. Besides, we were out here half the day yesterday getting briefed to death. Just give me the paperwork and let's be on our way."

Reluctantly, Sammy gathered up the thick pile of papers and handed them to his fearless leader. The Dynamic Duo arrived at their C-141 to find Sgt. Downs and his assistant, Amn. Ratchet, tying down large sheets of plywood in the cargo compartment.

"How's it going, Sergeant Downs?" asked C. R.

"Not too bad sir," was the reply. "At least we've got the right shoring kit. The winch checked out okay but the cable had some broken wires in it so we had it replaced. We'll be ready to go shortly."

"Excellent, m'lad," chortled the Field Grade Fumbler. With a friendly nod toward the now-departing SP and his canine companion who had just finished their own special walk-around, C.R. climbed the ladder to the cockpit.

A short time later the Starlifter sat with its APU shrieking as C.R. prepared to start engines.

"Stand by, sir," Sgt. Torque called over interphone. "I think we're about to pick up a couple more crewmembers."

"Huh, what next?" blustered C.R. "We've got enough people on this air machine now to start our own air force. Who is it?"

"There are two lieutenant colonels out here, sir," Sergeant Torque replied. "One of them is from HQ MAC Nuclear Surety and the other one is from HQ USAF. They've got orders authorizing them ACM on our flight by trip number. It looks like we're going to get a little no-notice type mission observation."

"Confound it!" the Great One fumed. "That's all I need. A couple of stanboard weenies breathing down my neck while I'm trying to get the job done. You'd think those desk 'jockies' would have better things to do with their time than chase all over the country harassing us poor working types."

Within minutes the two "observers" were properly identified, briefed by Sergeant Torque, and strapped in their seats. As the Addled Aviator ran the starting engines checklist, his brow furrowed with concentration. There had been an awful lot of information in those briefings the day before. He wished he could remember more of it. "Oh well," he reflected, "when the time comes, I'll figure out something."

He released the parking brake, and the Starlifter moved smoothly off the blocks and taxied toward the runway. Sammy confirmed destination security was ready and waiting, and soon they were airborne.

As the crew settled down to the routine of cruise flight, the Able Aeronaut turned to his second-in-command. "Sammy m'boy," he began, "how's about checking with our illustrious courier in the back and let's review what we're supposed to pick up at our first stop."

With that, Sammy summoned to the flight deck a rather greenish-looking young captain, whom C.R. immediately recognized as one of the squadron schedulers. Hmmm, C.R. thought, this trip must be a better deal than I thought.

"Good morning Major Terror," muttered Capt. Knute Tron. "I've taken the liberty of making you a little outline. You're supposed to pick up a total of 26 pieces at Blivot AFB. There should be four B-44s and 22 pieces of various components."

"And a partridge in a pear tree," Max chimed in. "Gee whiz, what a garbage run. Don't we ever get anything simple to do?"

"Knock it off, you ding-a-ling," the Silver-tongued Fox barked. "We've gotta get all this stuff straight. With those 'observers' watching every move we make, we can't afford any slip-ups."

"Right chief," Sammy and Max chorused in unison.

The trip was uneventful and soon the World's Greatest Aviator dropped the nose of his Starlifter on Blivot's runway with a tooth-jarring thud and called for the spoilers. They taxied to the ramp and, after only a short argument with ground control, found the hazardous cargo loading area. As they approached parking, C.R. noticed the security forces waiting to cordon off the aircraft and set up the secure area.

"Hey troops," he chuckled over interphone, "they're ready and waiting for us! How much ground time are we supposed to have?"

"Three hours," Sammy replied. "We're due off here at 1900Z."

"Okay, let's get cracking! We don't want to get behind schedule or we're gonna have to fill out all those monumental reports and changes to the itinerary."

As the Once Rotund One climbed down from the cockpit, he met the two lieutenant colonels who had come aboard just before takeoff.

"Good morning Major Terror," the first one said. "I'm Lt. Col. Boggle from MAC Headquarters. This is Lt. Col. Bloodgood from Air Force."

"Uh, glad to meet ya," C.R. stammered. "I hope you'll excuse me if I don't stand around and chat. We've got a schedule to keep and I've got to get things rolling outside."

"Of course, of course," Colonel Boggle replied. "We understand. You just go ahead as if we weren't here. We'll try to stay out of your way."

"Fine," the Ace of Airlift called, disappearing out the crew entrance door. Outside, the intrepid aviator found Captain Tron and the shipper exchanging credentials and preparing to inspect the cargo. As he hurried toward them, he saw the young captain shaking his head.

"What's the matter, son," inquired C.R. "Is there something wrong with the load?"

"Cheese, I guess," the captain replied. "This load isn't anything at all like the mission briefing described. We're supposed to have 26 pieces and he's only got 6. The pieces he's got are four W-29s and two B-62s, and I've never heard of them before."

"Well, that figures," C.R. mumbled. "Wing blew it again. I sure wish those guys would get something right for a change instead of expecting the crews to catch their mistakes. Sergeant Downs, can we get this stuff on the airplane allright? Will we still have enough room for the rest of our onload?"

"I'm not sure, sir," the loadmaster answered. "I've never seen these things before, and they're not in the Dash-16. I'm sure we can get them aboard, but we may have a problem with weight. They look heavier than our scheduled onload."

"Well, check on it," C.R. ordered, with an air of firm authority. "Run out a weight and balance with just these things aboard, and then another one with our whole onload. Figure a hundred and thirty-five thousand pounds of fuel too."

"Yes sir," the loadmaster replied.

"Now, sir," Captain Tron said to the shipper, "can you give us a briefing on these things? What kind of precautions should we take?"

"Ah, well, I don't know too much about them myself," the agent answered. "I just went over to pick up your load, and this is what they gave me. I guess you know as much about them as I do."

"But we've got to have some information on them, or we can't take them," the captain said. "Are they explosive? Do they have any radiation hazard? Does the two-man concept apply?"

"Well," the agent replied, "they've got these tags on them. I guess they should explain what they are."

"Wait a minute," Captain Tron interrupted, his voice rising a little now in exasperation. "Do you mean that you've got no shippers' briefing for us at all?"

"Not a regular one," the shipper answered. "I've been bringing these loads out here for years, and I've hardly ever been asked for one. I used to fill out the whole thing, but nobody ever listened to it, so I quit."

Knute Tron sighed and, shrugging his shoulders, turned to the Paunchous Pilot. "Major Terror, I don't know what to do."

"Now, Captain," C.R. soothed. "Let's not get all upset. There has been a little mistake someplace, but it's nothing a daring and resourceful MAC crew can't handle. I've had bigger buckets of worms than this. Let's check the tags on these things and see if we can get them aboard and tied down. We're the world's most cooperative airline, remember? If they want it moved, we'll move it."

While all this was going on, Colonel Bloodgood, the Air Force 'observer,' was busy walking around the load, looking at it carefully, and making notes in a little black book. Colonel Boggle, the man from MAC, however, had followed C.R. out of the aircraft and had listened with amazement to the entire conversation. After checking to be sure his Air Force counterpart was busy elsewhere, Colonel Boggle grabbed the Perilous Pilot by the sleeve.

"Major Terror," he whispered, "I don't think you really want to put that stuff on your airplane. If you'll check Chapter 4 of MACR 55-18, it'll explain it completely."

It took a moment or two for C.R. to realize just what was going on. Here, before his very eyes, was a typical, blood-thirsty, headquarters type, actually trying to help him. "Ya-ya-you m-mean we shouldn't take it?" he stammered.

"Of course not," Colonel Boggle replied. "You're being offered cargo that was not in the mission directive and isn't even in the Dash-16. Either one of these things is reason enough to reject it. If you add the fact your shipper is unprepared to brief you, you shouldn't touch that stuff with a 10-foot pole. The regulation will tell you to call HQ MAC/DOOMS for further instructions, and that's just what you need right now—further instructions."

The Petulant Pilot's brain quickly came up to speed. "Hold it, Captain Tron," he called to his frustrated courier who was walking toward the load. "Let's not rush into this!" Captain Tron and the shipper stopped and turned toward C.R. Colonel Bloodgood also looked up and began paying attention. "Ah, Captain," C.R. began, "I want you to dig out MACR 55-18 and check Chapter 4. I think you'll find that it contains some pretty specific instructions for a situation like this."

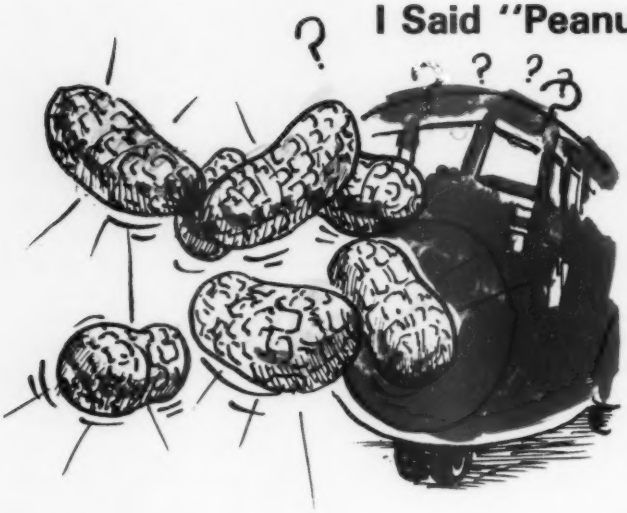
About this time, Sammy, who had been busying himself with cockpit duties, approached the group. He blinked in amazement at the Magic Major quoting regulations and chapters like this. Sam didn't think C.R. even knew there was a MACR 55-18. "Since we're obviously going to be delayed while this little conflict is resolved, Sammy, start working on a revised itinerary and all the messages we'll need. Also tell Sergeant Downs to just stand by awhile on that weight and balance he's working on. I'm going to contact higher headquarters and get us some additional instructions." C.R. stopped to take a breath and was struck by further inspiration. "And Sammy," he continued, "I want you to get all the specific facts and circumstances surrounding this entire situation. I'll need them to write up my trip report." Colonel Bloodgood smiled and made some more notes in his little book.

Much later, after some meaningful telephone coordination with MAC Headquarters, the Dynamic Duo finished the cruise checklist and relaxed as their Starlifter headed toward its next destination. Sammy turned toward his fearless commander. "Chief," he said, "I really was surprised at how you handled that mess back there. I thought we were gonna just press on regardless, like we always do, but you started quoting regulations and stuff like a Stan-Eval type. I never realized you were so familiar with all the nuclear airlift directives and such."

C.R. looked at his lanky copilot and smiled, "Boggles the mind doesn't it?" ★

QUICKSTOPPERS

I Said "Peanut Lite"



During an instrument approach, the IP called, "Go around" and the pilot at the controls of the C-130 initiated the maneuver. One small problem: Number 3 throttle stuck at 7,000 inch-pounds of torque. After climbing to a safe altitude, the crew shut down Number 3 engine, declared an emergency and returned to base. Safely back on the parking ramp, maintenance folks began the search for likely causes. Inspection of the throttle quadrant revealed a peanut light assembly causing the throttle to bind. Removal of the offending light restored full throttle operation. Small objects always look so benign; but in the wrong places they can be very unkind.

What a Spin I'm In

Flying a shallow final approach during a local transition sortie, an HH-1H crew experienced some unusual pedal displacement. After landing, the crew completed a controllability check and everything appeared normal. Stabilized in a three-foot hover, the helo began a 360-degree right turn with full left pedal applied. As the aircraft turned into the wind, the instructor pilot reduced power, lowered the collective, and landed. Once their eyeballs caged, the crew proceeded to accomplish a normal engine shutdown. A complete inspection of the tail rotor system revealed stripped splines on the tail rotor control quill and damaged control tube splines. A controllability check on the ground does not always reveal all your troubles.

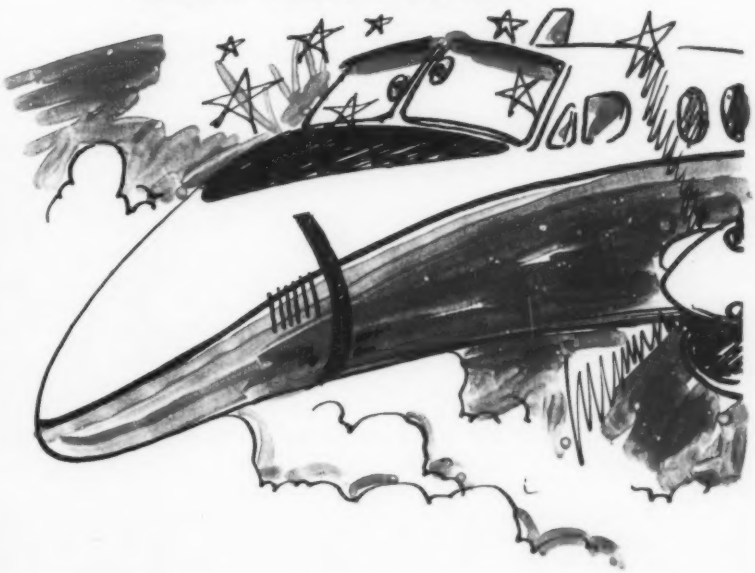
SMOKE IN THE COCKPIT

While descending from FL 350 to FL 250, the flight crew detected an odorous white smoke near the First Officer's kit bag. They immediately donned oxygen masks and goggles—a goggle type they weren't expecting. Consequently, the flight crew, expecting the new brand of goggles, used them incorrectly. Darkness (it was a night flight) added to the problem and the crew had trouble seeing the instrument panel due to parallax. The crew immediately initiated a descent, landed, and evacuated all passengers, two of whom sustained fractures. The wing evacuation slides blew over the trailing edge of the wing due to a 12-knot wind and couldn't be used. What caused the smoke? A faulty Air Cycling Machine (ACM) and oil that had entered the ACM duct.

Adapted From *On Course*, March 1990

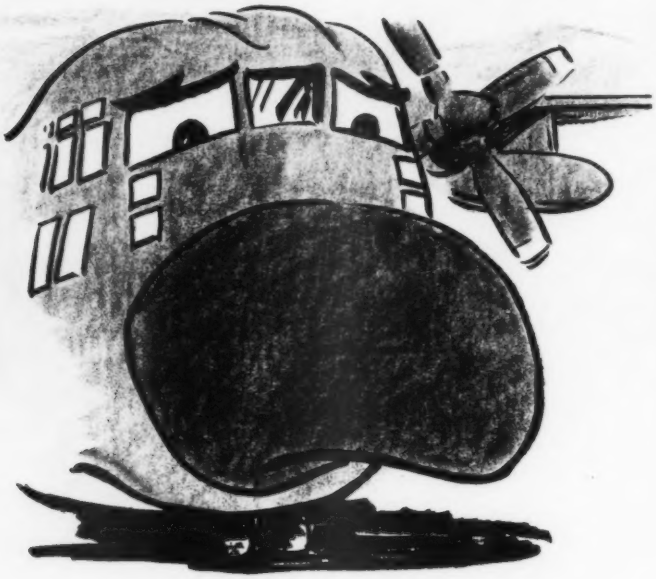
Check Valve Checked

Shortly after takeoff, the C-12F crewmembers detected a very faint smell of JP-4. As the turbo prop mini-airlifter turned base, fuel fumes filled the cabin. The IP could take it no longer and donned his oxygen mask. The masochistic copilot elected to keep breathing the fuel fumes until he felt "light-headed." Once the copilot put on his oxygen mask and began breathing the pure stuff, his light-headedness cleared up. Clearing up the source of the fumes wasn't as easy. Maintenance folks found a dirty one-way check valve. The valve supplied bleed air to the engine purge system. Fuel was entering the bleed air system through the sticky valve. As for the copilot, he found out why, when fumes are present, the first step is "Don Oxygen Mask."



QUICKSTOPPERS

UNSCHEDULED NOSE JOB

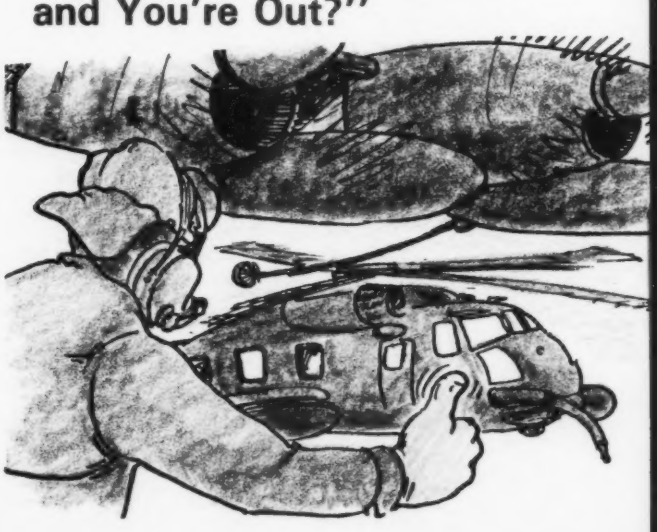


The C-130 was on single-ship, low-level airdrop mission. Our unsuspecting "casualty to be" was sitting in the cockpit observing flight crew operations and aircraft flying capabilities. Prior to the 20-minute warning, he was directed to return to the cargo compartment. As he walked to his seat, the aircraft made an unscheduled but necessary sudden turn causing our observer to fall and hit his nose on a seat cross bar. The loadmaster administered first aid. The mission was terminated, and the aircraft returned to base where the crew was met by an ambulance and flight surgeon. The "mishap observer" was treated and released. Could have been worse.

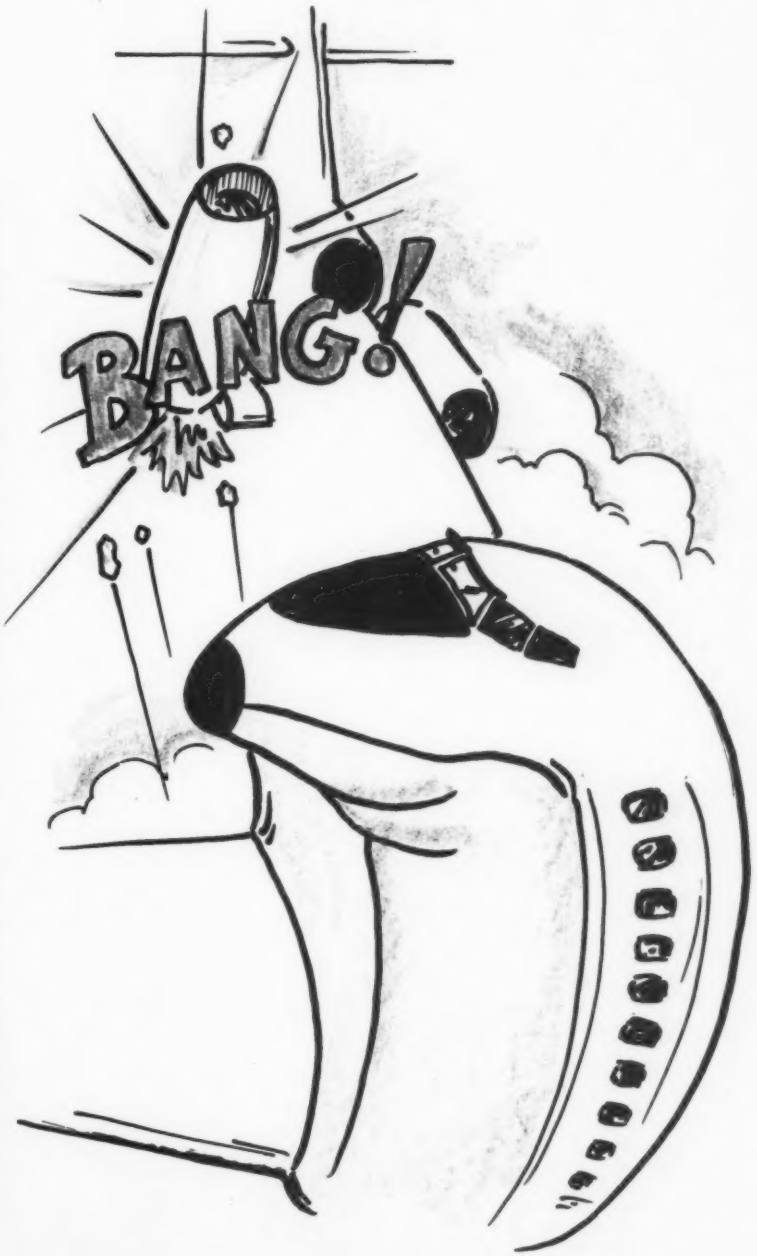
Is it "Third Time's a Charm" or "Three Strikes and You're Out?"

During an aerial refueling mission, an MH-53 made two contacts; both well controlled, firm, and directly centered in the drogue basket. After moving into refueling position, fuel flow was interrupted each time by inadvertent disconnects caused by light to moderate turbulence. A third contact attempt was made. The run-in was unsuccessful and a miss was initiated. The helicopter's forward motion was arrested and the helo was flown back to the precontact position. On the next attempt, forward movement stopped with the edge of the drouge touching four feet behind the probe tip. As forward aircraft movement stopped, turbulence increased and the drouge sailed up into the rotor tip path.

The IP assumed control and initiated a breakaway from the tanker. With the aircraft responding normally and no unusual vibrations present, the crew diverted to a nearby airport for a safe recovery. Close examination of the rotors revealed a damaged blade. Some days it just doesn't pay to get out of bed.



UNSCHEDULED DEPARTURE



The '727 climbed uneventfully to FL 350. Shortly after the Captain left his seat for a quick trip to the back, the First Officer heard a loud bang, the autopilot kicked off, and the aircraft yawed. He grabbed the yoke, immediately stabilized the aircraft, and reengaged the autopilot. A scan of the engine instruments revealed a Number 3 engine failure. The First Officer also noticed the "essential power failure light" illuminated and switched essential power to the Number 1 generator. When the Captain returned to the flight deck, he directed the First Officer and Second Officer to run the engine failure checklist. The crew declared an emergency and started descent with a revised clearance. During descent the crew dumped 7,500 pounds of fuel to get the aircraft down to 150,000 pounds. After completing descent, approach, and landing checklists, the aircraft made an uneventful ILS approach and landing. Unbeknownst to the flight crew, the Number 3 engine had separated from the aircraft. A chunk of blue ice from a leaking forward lavatory servicing panel is believed to have disloged and was carried by the airstream into the engine inlet. This caused a sudden twisting action of the engine due to high torque, separating it from the airframe at the shear bolts.

Adapted From *On Course*, March 1990

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After Deadlines

MAC GUNSHIP CREW WINS TUNNER AWARD--A Hurlburt Field, Fla., special operations aircrew received the Military Airlift Command's 1990 William H. Turner Award as the outstanding MAC aircrew. The award, sponsored by the Air Force Association, is named in honor of General Tunner, a retired Military Air Transport Command commander in chief. The AC-130 gunship crew assigned to the 16th Special Operations Squadron, was recognized for extraordinary achievement during a flight while participating in Operation "Just Cause" in Panama, 20 Dec 1989. By the end of their mission, the crew had been airborne for almost 16 hours, flown more than 4,000 miles, accomplished three aerial refuelings, and provided eight hours of close air support to U.S. ground troops engaged in combat with the enemy. The winning crew consisted of: Captains Mark P. Transue, Edward R. Appler, Philip G. Bradley, Scott E. Taylor, and John T. Virgione; 1st Lts. Dennis T. Beatty and Stephen D. O'Connor; MSgts. Steven W. Hicks and Frederick T. Kramer; TSgts. Guy M. Davis, II., William B. Walter, and Wayne S. White; SSgts. Frank T. Demchenko, Bernard R. Gilbert, William T. Jackson, William L. Jennings, and Michael K. McCarthy; and Sgt. Barry M. Clark.

DO YOU KNOW WHO THEY ARE?--The folks in flight safety that is. Have a problem? A question? They are there to help. Specializing in individual airframes and safety issues, they are:

Lt. Col. Kent Lee--Chief, Flight Safety, C-141--Human Factors, Configuration Control Board.

Maj. Rich Laski--C-5 System Safety Mgr--Hazard Reports, BASH, Safety Statistics, AFR 127-4/MACSUP.

Maj. Herm Lopez--C-141 System Safety Mgr--Night Vision Goggles, Special Operations, Manpower.

Maj. Mike Gampper--C-130 System Safety Mgr--Formal School, Aero Clubs, Airlift Rodeo, C-17Maj. Tom Farrier

Maj. Tom Farrier--Helicopter Systems Safety Mgr--All Helo/V-22--Mishap Review Panel, Airspace, AFR 127-2/MACSUP.

Maj. Bill Ogilvie--Support Airlift Systems Safety Mgr--All OSA/SAM/SPAR--Hazardous Air Traffic Reports.

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